MBC10SI1
Programmable Simple Indexer/Driver

User's Guide

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MBC10SI1 Features

- Output Current of 10.0A Peak
- 2000 Steps/Revolution
- On-Board Programmable Simple Indexer with 2 Motion Profiles
- Pulses From 1Hz to 50kHz
- Directional Soft and Hard Limit Switch Inputs
- Complete Output
- Busy Output
- Motor On/Off Input and Automatic Current Reduction
- Short Circuit Protection

General Description

The MBC10SI1 is a low cost single axis step motor driver integrated with a programmable simple indexer. The MBC10SI1 microstep driver/pulse generator has an output current capability of 1.5A minimum to 10.0A maximum (peak rating). The MBC10SI1 driver operates with a DC voltage of 20VDC to 80VDC. The MBC10SI1's internal controller has two different programmable motion profiles. The MBC10SI1 also has directional soft and hard limit switch inputs, a busy output and a complete output letting the user know when an inded is finished. The MBC10SI1 driver features direction control and motor current On/Off capabilities. The "Reduce Current Enabled" feature automatically reduces motor current to 50% of the set value. The driver has built in features to indicate power on (green LED), running (yellow LED) and error conditions (red LED). The MBC-10SI1 has a fixed step resolution of 2000 steps/revolution for a 1.8° stepper motor. The bipolar drive configuration handles 4, 6, and 8 lead step motors and is also equipped with over current protection. The MBC10SI1 communicates via USB communication. The easy to use Windows software, SMPG-SMSI Software, is used to directly set up the two different motion profiles.

Motion Profiles and Running the Indexer

The programmable simple indexer has the ability to store up to two different motion profiles. The profiles include a base speed (starting speed), a maximum speeds (running speed) acceleration/deceleration, the number of steps (index) and a complete time (output signal). The base speed has a range of 1-5000Hz, the maximum speed has a range of 1 Hz-50 kHz and the acceleration/deceleration has a range of 100 to 9,999,999 steps/sec^2 and the index has a range of 0-8,388,607 steps and the complete time has a range of 1-1000 milliseconds.

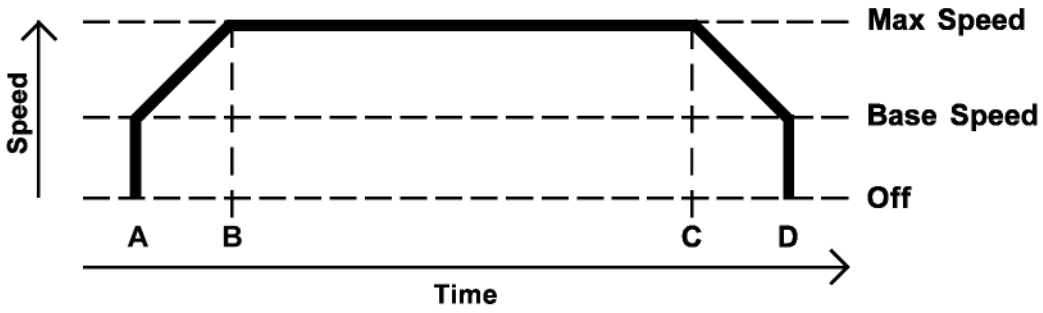
There are "two ways" to get the unit to index: Examples are shown on the next page.

1. The first way is to directly control it from the computer with the software provided. Once the motion profiles have been set, the unit is ready to run. From the software, the user can select which profile to run and then click the begin motion button. If a soft limit command is sent or a soft limit input is activated, then the unit will immediately ramp down to base speed and stop. To stop motion immediately a hard limit command needs to be sent or a hard limit input must be activated.
2. The second way to make the unit run is to activate the individual index input. When an index input is activated, it selects from memory the speed profile that was selected. If a soft limit input is activated, then the unit will immediately ramp down to base speed and continue running until the index has completed. To stop all motion before the index has completed a hard limit input must be activated.

Motion Profiles and Running the Indexer: Continued

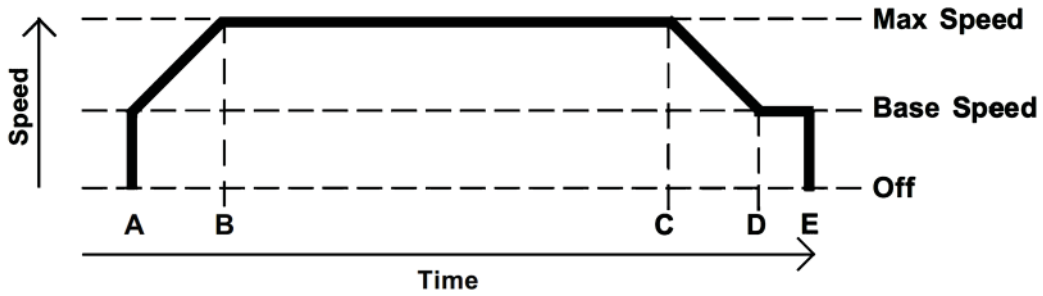
Normal Operation

A. A Profile input is activated; Ramps up to max speed.
B. No limit is active; Max speed is reached (keeps running at max speed).
C. No Limit is active; Internal counter signals to ramp down to base speed.
D. Internal Counter is complete; Base speed is reached. Pulses stop.



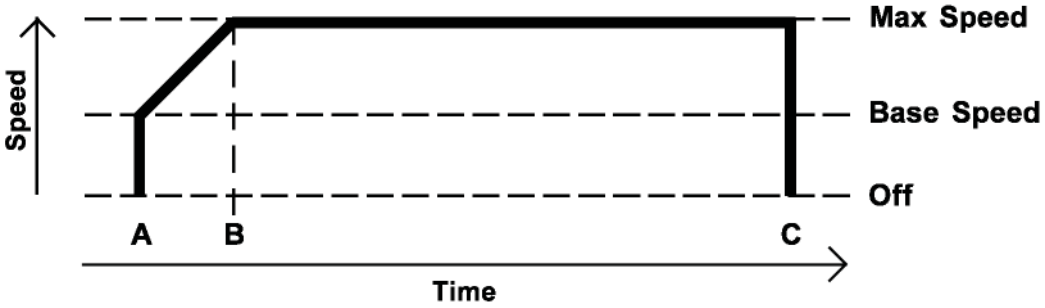
Soft Limit Activated During Index

A. A Profile input is activated; Ramps up to max speed.
B. No limit is active; Max speed is reached (keeps running at max speed).
C. Soft limit is activated; Ramp down to base speed.
D. Base speed is reached; Continue until counter is complete.
E. Internal Counter is complete; Pulses stop.



Hard Limit Activated During Index

A. A Profile input is activated; ramps up to max speed.
B. No limit is active; Max speed is reached (keeps running at max speed).
C. Hard limit is activated; Pulses stop (Index did not complete).



LEDs

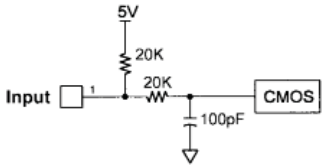
When powered and operated properly, the status LED will be green. When a communication or program syntax error occurs, the LED will change to RED and an error code will be generated in the error code register. To read and clear the error with the software, click on the "Verify Parameters" button. To read and clear the error while in "Direct Mode" use the "!" command. Once the error has been read and cleared, the LED will return to green and the error code register will be cleared. Refer to the table in the trouble-shooting section for a list of the error codes. When the indexer is running the yellow LED will be on. Refer to the dimension drawing for location of the LEDs. For more detail on "Direct Mode" Refer to the Direct Talk Mode Section of User's Guide.

Baud Rates

A term used frequently in serial data communications. A "baud" is defined as the reciprocal of the shortest pulse duration in a data word signal, including start, stop, and parity bits. This is often taken to mean the same as "bits per second", a term that expresses only the number of "data" bits per second. Very often, the parity bit is included as an information or data bit. The MBC10SI1 only accepts a baud rate of 38400.

Inputs and Outputs

Inputs: All inputs are pulled up to 5VDC. A logic "0" activates inputs that are pulled up. An unconnected input will always remain inactive.



Direction: When this input is not active, the motor will be moving in the clockwise or "+" direction. When this input is active, the motor will move in the counterclockwise or "-" direction. This input is not read when a software index command is given. To change direction while using the software, change the direction option there. When two motors are used, the second motor will move in the opposite direction by default.

On/Off: When this input is not active, the motor will enabled or energized. When this input is active, the motor will be disabled or de-energized.

Index 1 and 2: These inputs are used to select on of the two profiles. When one of the profiles is activated, the unit will change the speeds, acceleration and index number based on the pre-programmed values for that profile and begin the index. Activate only one of these two inputs at once.

Soft Limits: These two inputs are controlled by the direction of the indexer. When the indexer is running in the positive direction only soft+ will work. When the indexer is running in the negative direction then only soft- will work. When pulled low the motor will ramp down to base speed and continue running until the index is completed or a hard limit is reached.

Hard Limits: These two inputs are controlled by the direction of the indexer. When the indexer is running in the positive direction only hard+ will work. When the indexer is running in the negative direction then only hard- will work. When pulled low the indexer will stop all pulses to the motor. To reverse off of a Hard Limit, change directions, and activate another profile input again to move in the opposite direction.

Complete Output: This is an open collector output that is capable of sinking 10mA. It is current sinking when the indexer completes its motion and is only active for the pre-programmed time.

Busy Output: This is an open collector output that is capable of sinking 10mA. It is current sinking when the indexer is running and open when the indexer is not running.

Connector Descriptions

Connector P2:	
Pin #	Description
1	Power Supply Ground (0VDC)
2	Power Supply Input (20VDC - 80VDC)
3	Motor Phase 1 (A)
4	Motor Phase 3 (/A)
5	Motor Phase 2 (B)
6	Motor Phase 4 (/B)
7	Index 1
8	Index 2
9	Motor On/Off
10	Direction In
11	Busy Output
12	Complete Output
13	Soft Limit +
14	Soft Limit -
15	Hard Limit +
16	Hard Limit -

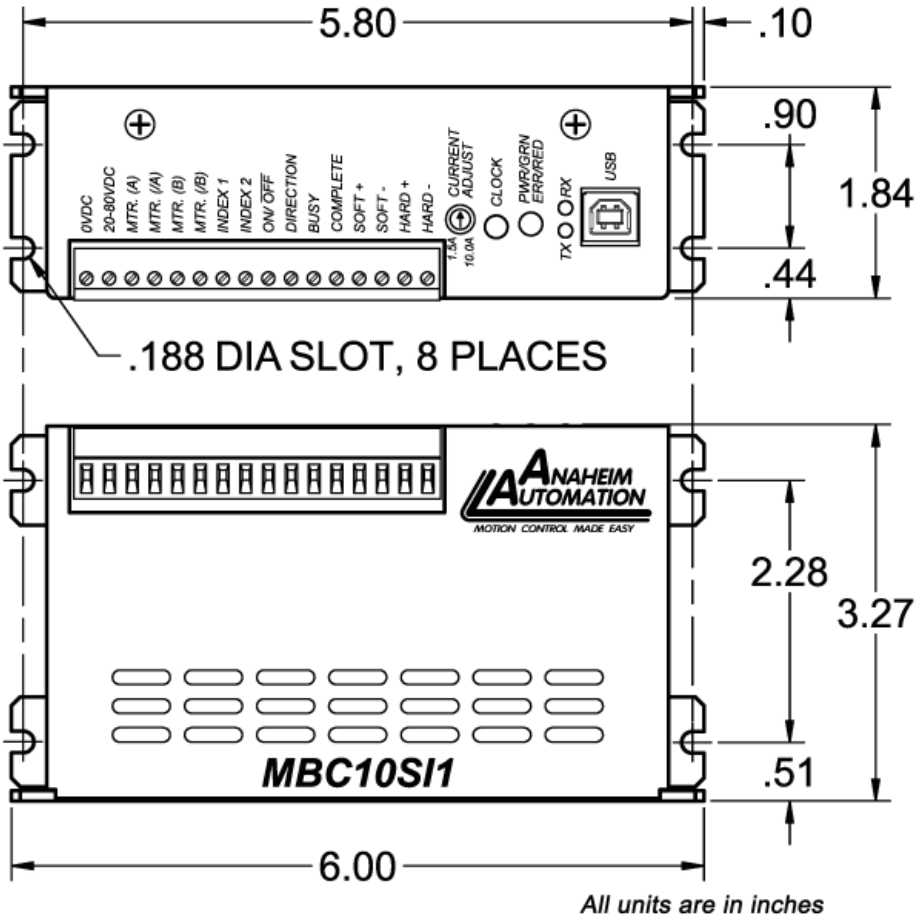
Ordering Information

Part Number	Description
MBC10SI1	10.0A Microstep Driver with Integrated Programmable Simple Indexer
PSA80V4A	Power Supply for MBC10SI1 (80V @ 4.0A)
AAUSB-6	6 foot USB communication cable, A-Male to B-Male

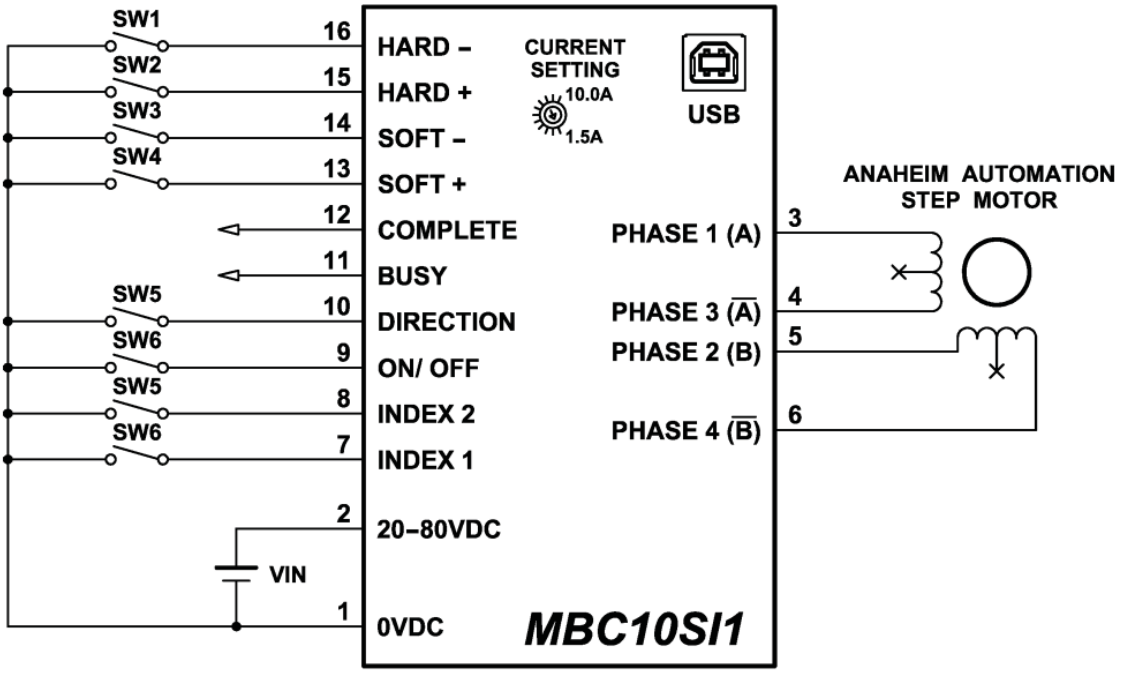
Specifications

Voltage Requirements:	20 - 80 VDC	
Run Input (P2, Pin 5,6,7 and 8):	Start	Low (0VDC)
Direction Input (Pin):	CW	High (Open)
	CWW	Low (0VDC)
On/Off Input (Pin):	On	High (Open)
	Off	Low (0VDC)
Busy Output (Pin):	Open Drain type Output, 75mA Sink, 40VDC Stand Off	
Clock Output (Pin 1):	Open Drain type Output, 75mA Sink, 40VDC Stand Off	
Clock Out Frequency (P3, Pin 1):	Min	1 Hz
	Max	50kHz
Output Current: T_A=25°C	Min	0.5A peak
	Max	10.3A peak
Driver Chopping Frequency:	25kHz - 30kHz	
Operating Temperature:	0° - 70° C	
LEDs	Green	Power On
	Red	Programming Error
	Yellow	Pulse Generator is busy
Com Port Settings:	115200,N,8,1	

Dimensions



Wiring Diagrams



Setting the Output Current

The output current on the MBC10SI1 is set by the on-board potentiometer R29 (Refer to Dimensions/Jumper and Potentiometer Locations). This current adjust potentiometer determines the per phase peak output current of the driver. This relationship between the output current and the potentiometer setting is as follows:

Potentiometer Settings

Peak Current	Potentiometer Setting
1.5A	0%
2.4A	10%
3.0A	20%
4.0A	30%
5.2A	40%
6.4A	50%
7.7A	60%
8.7A	70%
9.8A	80%
10.0A	90%
10.3A	100%

Reducing Output Current

Reducing the output current is accomplished automatically depending on the current reduction setting in the SMPG-SMSI software. The amount of current per phase in the reduction mode is approximately 70% of the set current. When the current reduction circuit is activated, the current reduction resistor is paralleled with the current adjustment potentiometer. This lowers the total resistance value, and thus lowers the per phase output current. This is done when the pulse generator is not running.

Determine Output Current

The output current used for motor when microstepping is determined differently from that of a full/half step unipolar driver. In the MBC10SI1, a sine/cosine output function is used in rotating the motor. The output current for a given motor is determined by the motors current rating and the wiring configuration of the motor. There is a current adjustment potentiometer used to set the output current of the MBC10SI1. This sets the peak output current of the sine/cosine waves. The specified motor current (which is the unipolar value) is multiplied by a factor of 1.0, 1.4, or 2.0 depending on the motor configuration (series, half-coil, or parallel).

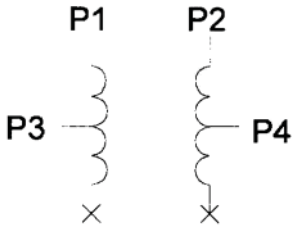
Step Motor Configurations

Step motors can be configured as 4, 6, or 8 leads. Each configuration requires different currents. Refer to the lead configurations and the procedures to determine their output current.

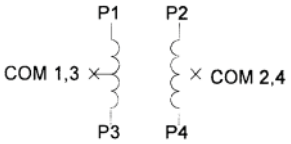
WARNING! Step motors will run hot even when configured correctly. Damage may occur to the motor if a higher than specified current is used. Most specified motor currents are maximum values. Care should be taken to not exceed these ratings.

6 Lead Motors

When configuring a 6 lead motor in a **half-coil configuration** (connected from one end of the coil to the center tap), multiply the specified per phase (or unipolar) current rating by 1.4 to determine the current setting potentiometer value. This configuration will provide more torque at higher speeds when compared to the series configuration.

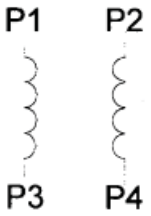


When configuring the motor in a **series configuration** (connected from end to end with the center tap floating) use the specified per phase (or unipolar) current rating to determine the current setting potentiometer value.



4 Lead Motors

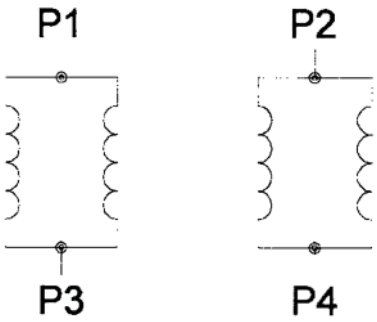
Multiply the specified **series** motor current by 1.4 to determine the current adjustment potentiometer value. 4 lead motors are usually rated with their appropriate series current, as opposed to the *Phase Current*, which is the rating for 6 and 8 lead motors.



8 Lead Motors

Series Connection: When configuring the motor windings in series, use the per phase (or unipolar) current rating to determine the current setting potentiometer value.

Parallel Connection: When configuring the motor windings in parallel, multiply the per phase (or unipolar) current rating by 2.0 to determine the current setting potentiometer value.



Note: After the current has been determined, according to the motor connections above, use the potentiometer setting table to choose the proper setting for the current setting potentiometer.

Connecting the Step Motor

The MBC10SI1 is designed to accept one motor. For wiring of the motor refer to the pages containing the connector descriptions and hookups diagrams. The motor is wired into pins 3, 4, 5 and 6 of the terminal block.

Note: The physical direction of the motor with respect to the direction input will depend on the connection of the motor windings. To reverse the direction of the motor with respect to the direction input, switch the wires on phase 1 and phase 3. With the operation of 2 motors, they will run in the opposite direction when wired the same.

WARNING: Do not connect or disconnect motor wires while power is applied!

Circuit Protection

This driver is equipped with over current protection.

Note: When drive experiences a fault condition, it will seize to function. Power down, inspect wiring, motors, etc. and allow for a 30 second pause to resume functioning. If driver is too hot, additional ventilation and airflow should be added to prevent temperature to exceed recommended temperature limit.

Functions

Hard Limit Switches: When a hard limit switch is encountered, the pulses will stop. Hard limits are intended as an emergency stop for your system.

Soft Limit Switches: These switches cause the indexer to ramp down to the base speed and finish the index, unless encountering a hard limit switch.

Profile Inputs: These inputs are used to select and begin the specified motion profile. Only 1 input should be activated at a time.

Motion Profiles: The indexer will accept two different speed or motion profiles. Each profile has its own programmable Accel/Decel, Base speed and distance value. These values are stored in EEProm for standalone use and must be programmed before the indexer is ran.

Acceleration/Deceleration: The acceleration and deceleration are by default the same value. This function controls the time that the motor will take to move from base speed to max speed. The higher the value, the slower the motor will accelerate. The same principle applies for the deceleration which is controlling the time it takes to go from maximum speed to base speed. The higher the value, the slower the pulses will decelerate. The different accel/decel profiles are stored in EEprom for standalone use. (Range: 100 to 9,999,999)

Base Speed: The base speed is the speed at which motion starts and stops. It is entered directly as the number of steps per second. This speed must always be less than the max speed. The different base profiles are stored in EEprom for standalone use. (Range:1 to 5000)

Max Speed: The max speed is the top speed the user wants the pulses to run at. This speed must always be equal or greater than the base speed. It is entered directly as the number of steps/second. The different max profiles are stored in EEprom for standalone use. (Range:1 to 50,000)

Index Number: The index number is the number of steps that the motor will take when the motion profile starts. It is entered directly as the number of steps to take. The different index profiles are stored in EEprom for standalone use. (Range: 0 to 8,388,607)

Complete Time: The complete time is the duration that the complete output is held after an index has completed. This number is entered in the number of milliseconds that the output is to be held low.

Direction Input: If this input is open then the unit will be running in the clockwise direction. If this input is active then the unit will be running in the counterclockwise direction. This pin can be overridden by the programmable software direction. It will activate the direction output when the pin is changed. This means, that if you start the profile from the software, the unit will look at the software direction. If you start the indexer from the inputs, then the unit will look at the direction input.

Busy Input: This output will be pulled low when the indexer is operating. It is an open drain output so when the indexer is not running the pin is open.

Complete Output: This output will be pulled low after the indexer is done indexing for the duration given in the complete time parameter. It is an open drain output so when the output is not active the pin is open. It is entered directly as the number of milliseconds the output will be active for. The different complete time profiles are stored in EEProm for standalone use. (Range:1 to 1000)

SMPG-SMSI Software

The SMPG-SMSI software is a handy utility that supports Anaheim Automation's programmable pulse generators and simple indexers. Connecting your PC to the MBC10SI1, via a serial cable, the software can easily perform the following tasks:

- Exercise and monitor the MBC10SI1
- Directly communicate with the MBC10SI1

Installation

Software

- The SMPG-SMSI software is supplied on a CD, containing the setup program and the software.
- SMPG-SMSI software is compatible with all versions of Windows including Windows 2000, Windows XP, Vista, and Windows 7

Windows 3.x Installation

1. Insert the CD into the drive
2. From the Program Manage select **File** | **Run**
3. Enter **D:\setup** and click **OK** - use the appropriate drive letter (i.e. **D** or **E**)

Windows 95/98/NT/ME/2000/XP Installation

Option 1

1. Insert the CD into the drive
2. From the Program Manager select **Start** | **Run**
3. Enter **D:\setup** and click **OK** - use the appropriate drive letter (i.e. **D** or **E**)

Option 2

1. Open Windows Explorer
2. Open CD Drive Folder (D: or E:)
3. Double Click the setup Icon

Getting Started

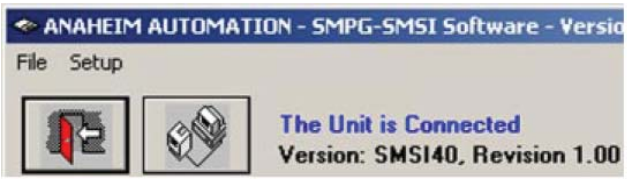
1. Double click on the SMPG-SMSI icon to run the software.
2. Apply power to the MBC10SI1 unit.
3. Set the appropriate communication setting by selecting Setup | Communication Setting from the menu bar.
4. Establish communications with the MBC10SI1 by clicking on the Connect Icon, or select Setup | Connect. If the unit is connected properly, the program will notify you when communication has been established and the correct programming tab will be enabled to let you work with the unit

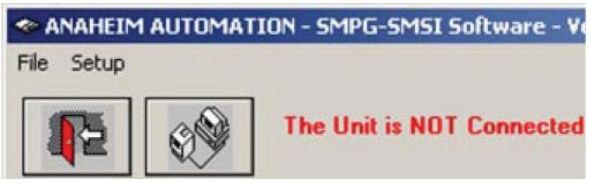
Changing the COM Port Number of the USB port

1. From **DeviceManager**, select **"View devices by type"**, then **"Ports (COM & LPT)"**. Select the USB serial port and click **Properties**. Select the **"Port Settings"** tab, then click **Advanced**.
2. Choose the required COM port number from the list and click **OK**.

“The Unit is Connected” / “The Unit is Not Connected”

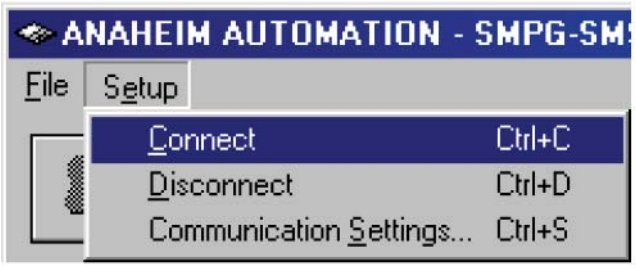
On the right of the Toolbar, the user will find the communication status of the indexer. If communications is not established, please refer to the troubleshooting section.





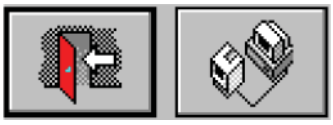
File Menu

Setup Menu



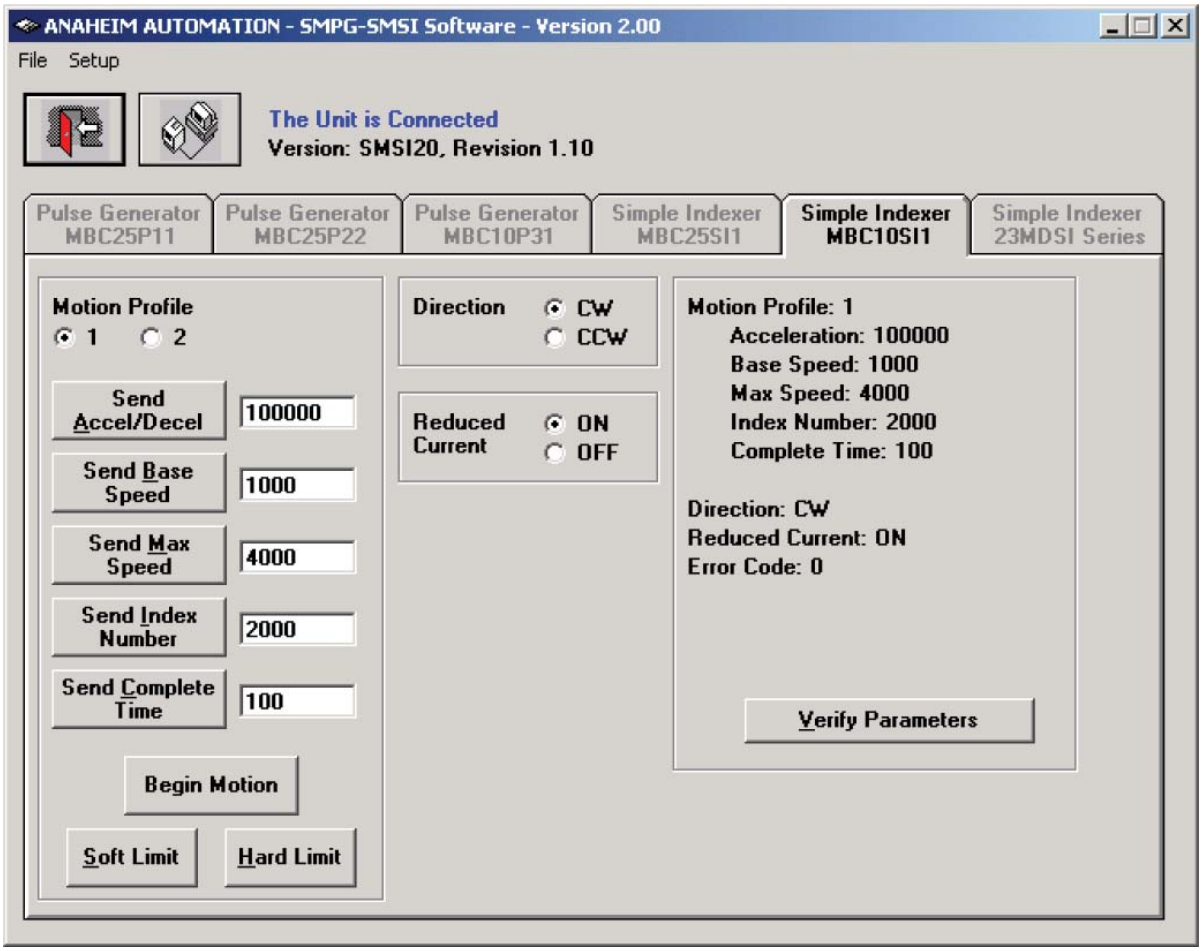
Exit	Exit the SMPG10WIN Software
Connect	Establish communications with the controller.
Disconnect	Discontinue communications and release the comport for use by other devices.
Communication Settings...	COM port Selection (Ports 1, 2, 3, 4, 5, 6 or 7)

Toolbar



Exit	Exit the SMPG-SMSI Software
Connect	Establish communications with the controller.

Program Window



Motion Profile	Select motion profiles 1, or 2.
Send Accel/Decel	Send the acceleration & deceleration parameter to the indexer. (steps/sec^2)
Send Base Spend	Send the base speed parameter to the indexer. (steps/sec)
Send Max Speed	Send the maximum speed parameter to the indexer. (steps/sec)
Send Index Number	Send the index number parameter to the indexer. (steps)
Begin Motion	Motor will ramp up to maximum speed and keep moving until a limit switch is triggered or the index is complete.
Soft Limit	Motor will ramp down to base speed and continue running until the index is complete.
Hard Limit	Stop any motor motion.
Direction	Set direction to clockwise or counter-clockwise.
Reduced Current	Set reduced current on or off.
Verify Parameters	Updates and displays controllers parameters and resets the error codes.

Direct Talk Mode

Direct mode is used to directly control the motion for real time movements through serial communication. The indexer has 14 commands which are easy to remember for direct movement of a step motor.

COM Port Settings

Baud Rate: 115200
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: Xon/Xoff

Unit Selection

In order to select a unit the @ command followed by 0 (address of the unit) must be sent.
NOTE: There should be no spaces between the @ and the 0.

How to select the unit:

@0 (Unit is selected)

How to get a response from the unit:

@0$ (Carriage Return)

After the $ command, the pulse generator will return a SMSI20 + the current version number.
Note: In direct talk mode each command is followed by a carriage return.

The unit communicates in half duplex mode, therefore proper setup of hyper terminal is necessary to view characters, if characters are to be echoed back to the screen.

Instructions

All instructions require that no spaces be sent between the command and the parameter followed by a carriage return. The commands are also case sensitive and are all sent as capitals.

Command Summary:

A - Acceleration/Deceleration
B - Base Speed
C - Current Reduction
G - Go (Index)
H - Hard Limit
M - Max Speed
N - Index Number
S - Soft Limit
T - Complete Time
V - Verify
+ - Clockwise Direction
- - Counterclockwise Direction
$ - Version Number Register
! - Error Codes Register

$ - Version Number Register

Format: $

Description: This command request the pulse generator to return the version number.

! - Error Codes Register

Format: !

Description: This command requests the pulse generator to get the current error code and print it to screen.

+/- - Direction

Format: + or -

Description: This command sets the direction output. A “+” sets the output to clockwise, and a “-” set the output to counterclockwise. This must be done when the indexer is not busy. This value is saved in the EEprom for standalone use.

A - Acceleration/Deceleration

Format: A#_[value] - where # is the motion profile number 1 or 2

Sample: A1_10000 Accel of profile 1 equals 10000

Description: This command sets the acceleration profile which can be an integer value between 100 and 9,999,999. These values are saved in the EEProm for standalone use.

Range: 100 - 9,999,999

B - Base Speed

Format: B#_[value] - where # is the motion profile number 1 or 2

Sample: B2_500 Base Speed of profile 2 equals 500

Description: This command sets the base (start) speed for motion. This value must be set before motion begins and be less then the maximum speed. The pulses will ramp down to this speed after a soft limit is triggered and run at this speed until a hard limit is triggered or the index has finished. These values are saved in the EEProm for standalone use.

Range: 1 - 5000

C - Current Reduce Option

Format: C# - where # is 0 or 1

Description: This command enables the driver to reduce current after pulses are done being sent. A 1 will enable current reduction, and a 0 will disable current reduction. This value is saved in the EEProm for standalone use.

G - Go Slew (Run)

Format: G# - where # is the speed profile number 1 or 2

Description: This command will send clocks out to the indexer. The only command that can stop the clocks is H (stop motion). The S (soft limit) command will make the pulses go from max speed to base speed. Motion can also be stopped by using the limit switch inputs. The ramp profile is specified by the B (base speed), M (max speed), and A (acceleration/deceleration) commands.

H - Hard Limit or Stop Motion

Format: H

Description: This command will stop all motion. It can only be used when the unit is indexing.

M - Max Speed

Format: M#_[value] - where # is the motion profile number 1 or 2

Sample: M2_10000 Max Speed of profile 2 equals 10000

Description: This command sets the maximum (running) speed for motion. This value must be set before motion begins and be equal or greater than the base speed. The motor will run at this speed until a soft limit or a hard limit is triggered. These values are saved in the EEProm for standalone use.

Range: 1 - 50,000

N - Index Number

Format: N#_[value] - where # is the motion profile number 1 or 2
Sample: N1_10000 Index number of profile 1 equals 10000

Description: This command sets the number of pulses to index for the motion profile. This value must be set before motion begins. These values are saved in the EEProm for standalone use.

Range: 0 - 8,388,607

S - Stop Soft

Format: S

Description: This command will cause the indexer to ramp down to base speed and run until the index is complete or a hard limit is activated. It can only be used when pulses are running.

T - Complete Time

Format: T#_[value] - where # is the motion profile number 1 or 2

Sample: T1_100 Complete Time of profile 1 equals 100

Description: This command sets the time for an active complete signal after the unit has finished indexing for the motion profile. The number is entered as milliseconds. This value must be set before motion begins. These values are saved in the EEProm for standalone use.

Range: 0 - 1000

V - Verify

Description: This command can be used with most commands to verify the register contents. This is a read only command. Valid Commands are: A, B, C, D, M, R, and +.

Format: V[command]
This format is good for C, and +.
- C - If a 1 is sent back then the driver is in reduced current mode. If a 0 is sent back then the driver is not in reduced current mode.
- + - If a 1 is sent back then the direction is clockwise. If a 0 is sent back then the direction is counterclockwise.

Sample: V+ Verification of Direction is prompted.

Format: V[command]# - Where # is the speed profile number 1 thru 4
This format is good for A, B, and M.
- A# - Verify Acceleration/Deceleration for given speed profile.
- B# - Verify Base Speed for given speed profile.
- M# - Verify Max speed for given speed profile.
- N# - Verify Index number for given speed profile.
- T# - Verify Complete time for given speed profile.

Sample: VB2 Verification of Base Speed in Profile 3 is prompted.

Visual Basic Direct Mode Programming Examples

Example 1: This Example is for Axis=0, and Profile=1

```
DimConst DefaultTimeout As Single = 0.5
        frmMain.MSComm1.Output = “@0A1_100000” & Chr$(13)  ‘SetAcceleration
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0B1_1000” & Chr$(13)    ‘Set Base Speed
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0M1_4000” & Chr$(13)    ‘Set Maximum Speed
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0N1_500” & Chr$(13)     ‘Set Index Number
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0T1_100” & Chr$(13)     ‘Set Complete Time
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0+” & Chr$(13)          ‘Set Direction CW
        Pause DefaultTimeout
        frmMain.MSComm1.Output = “@0G1” & Chr$(13)         ‘Start the Index
        Pause DefaultTimeout
```

Example 2: This Example receives the error code and Version Number from Axis3

```
DimConst DefaultTimeout As Single = 0.5
        frmMain.MSComm1.Output = “@3!” & Chr$(13)
        Pause ShortTimeOut
        MsgBox RecieveAscii()
        frmMain.MSComm1.Output = “@3$” & Chr$(13)
        Pause ShortTimeOut
        MsgBox RecieveAscii()

   Function ReceiveAscii() As String
        ‘wait for the incoming data to get to the buffer
        Dim BeginTime as Single
        Dim A As Integer
        Dim B As Integer
              BeginTime = Timer
              While Main.MSComm1. InBufferCount = 0
                    DoEvents
              If Timer - BeginTime > 0.1 Then GoTo ExitRoutine1
              Wend
              A = 0: B = Main.MSComm1.InBufferCount
              While A <> B
                    A = Main.MSComm1.InBufferCount
                    Pause 0.02                          ‘ Fixed time value
                    B = Main.MSComm1.InBufferCount
              Wend

              ReceiveAscii = Main.MSComm1.Input
         Exit Function
```

Troubleshooting

Problem:

Can not establish communications with the unit.

Possible Solutions:

1. Make sure the indexer has power. Is the Green LED on.
2. Check USB connections.
3. Check for loose cable connection either on the pulse generator or COM Port.
4. Was the software installed successfully?
5. Go to **Setup | Communication Settings** and verify COM Port settings.
6. Click on **Connect** icon to communicate with the unit.
7. If problems still exist, contact Anaheim Automation Tech Support.

Problem:

There is no power to the indexer.

Possible Solutions:

1. Is the Indexer connected to the appropriate power supply?
2. Check for any blown fuses in line with the unit.
3. If problems still exist, contact Anaheim Automation at 714-992-6990.

Problem:

The indexer has a fault condition.

Possible Solutions:

1. To Clear an error use either the SMPG-SMSI software or the direct mode command.
2. The SMPG-SMSI software can clear an error in the motion tab section by clicking on the Verify Parameters button.
3. The direct mode command "!" can clear an error by prompting indexer to serially send the error code back to the user.

Example: @0! (carriage return)

Description: Address the unit by typing @ followed by a 0 (address number) an ! (Error Codes Register) and a carriage return.

Note: The error code is returned in binary coded decimal format. If two errors were received their binary values would be added together.

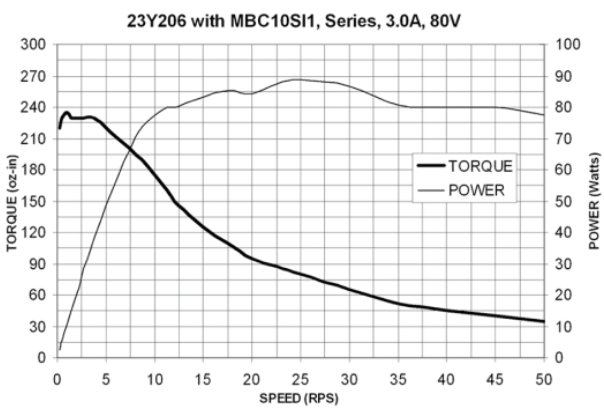
Error Codes

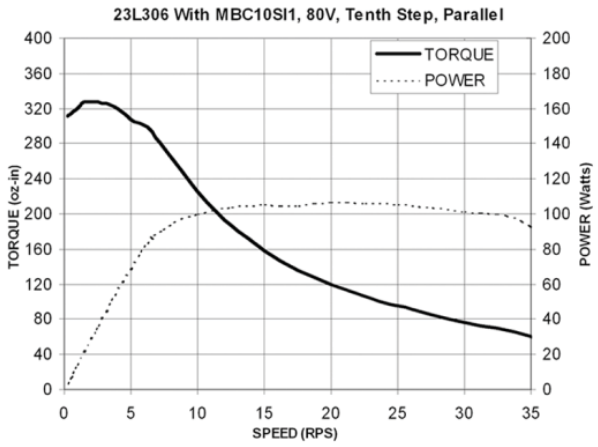
Error Code	Type	Description
1	Receive Overflow Error	The serial communications had a receiving error. This is an internal error caused by the computer.
2	Range Error	There was an invalid number of characters sent to the pulse generator. Check to see if the parameters are invalid for the command that was sent.
4	Command Error	A bad command was sent to the pulse generator. Please check to see that the command being sent is valid, or that the pulse generator is not running.
8	Transmit Error	To many parameters sent back to the PC. This is an internal error cause by the EEProm.
16	Motor Error	Motor speed profiles are set incorrectly. Please make sure that the base speed is less than the max speed and that the speeds are within their valid ranges.
32	Zero Parameters Error	There were no parameters sent to the pulse generator. A command was sent to the pulse generator that expected to see parameters after the command.

ASCII Table for Direct Mode

ASCII Symbol	Hex Value	ASCII Symbol	Hex Value
Carriage Return	0D	C	43
0	30	G	47
1	31	H	48
2	32	M	4D
3	33	N	4E
4	34	R	52
5	35	S	53
6	36	V	56
7	37	!	21
8	38	$	24
9	39	+	2B
A	41	-	2D
B	42	_	5F

Torque Speed Curves





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Anaheim Automation will repair or replace at its' option, any product which has been found to be defective and is within the warranty period, provided that the item is shipped freight prepaid, with previous authorization (RMA#) to Anaheim Automation's plant in Anaheim, California.

TECHNICAL SUPPORT
If you should require technical support or if you have problems using any of the equipment covered by this manual, please read the manual completely to see if it will answer the questions you have. If you need assistance beyond what this manual can provide, contact your Local Distributor where you purchased the unit, or contact the factory direct.